from the prison proper into another portion of the same building, with conditions practically the same as before. Reference to the table above shows that after the first month there were no new cases.

The question naturally arises that with the presence of beriberi in Panama, and the appearance of sporadic cases in the Zone, what are the chances of an outbreak of this disease among the laborers of the commission, the same as occurred under the French régime? It is believed that the improved sanitary conditions, better habitations, the feeding of the laborers by the commission, this insuring a better dietary, and our increased knowledge of the management of tropical disease, will all tend to render an outbreak of this disease improbable.¹

AN OPERATIVE METHOD FOR THE REDUCTION OF HYPERTROPHY OF THE INFERIOR TURBinate

OTHER THAN BY CAUTERIZATION OR EXSECTION.*

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If the methods of treatment now in vogue for the reduction of hypertrophy or hyperplasia of the inferior turbinate were wholly free from objectionable features it were then, indeed, superfluous to write aught concerning it. As it is there are so many, and so serious, objections to each method now commonly employed that it may not be misconstrued if an effort be made to advance some suggestion for its relief other than those generally accepted.

Any treatment which primarily gives temporary relief, but whose secondary effects are hurtful, worse, indeed, than the original disease which it is sought to relieve, must be relegated to the rear as soon as another method is brought forward whose primary effect is fully that desired, permanent in nature and followed by no secondary effect whatever except that which is beneficial. If it can be proven that such result is attainable without any extraordinary instrumentation, without violence to the patient, while preserving important functioning tissue now often sacrificed in part or *in toto*, then the writing of another page on so hackneyed a subject is fully justified.

Before a body of rhinologists it is unnecessary to rehearse the several well-known and accepted functions of the nose. In view, however, of the fact that collapse of the *alæ nasi* so often follows the destruction of the inferior turbinate whether by cautery or by exsection, there must be some physical explanation of the agency by which the patency of the vestibule is maintained. If it were muscular action alone that keeps open the vestibule, then the removal of the inferior turbinate would have no injurious action whatever on it, for there is not any connection that I am aware between the inferior turbinate and the muscles of the *alæ*.

It is generally conceded that the compressors and dilators of the *nasi* are very seldom under voluntary control, that they are practically useless structures, unless by patient, long-continued practice they are brought under control of the will, and then only if the inferior turbinate is present. I have followed up this observation as closely as it was possible for me to do and I have never seen a case in which the patient whose turbin-

ates were absent learned after their loss to control the *alæ nasi* muscles. It is obvious, then, that muscle action has little, if anything, to do with this condition of the vestibule. That the inferior turbinate subserves an important purpose is established by the fact that collapse never occurs when it is present and almost invariably follows its removal.

To be liberal in judgment, it would be well to ascribe the duty of maintaining the patency of the vestibule to the conjoined action of the muscles of the *alæ nasi* together with the inferior turbinate, the greater influence by far being exerted by the latter structure.

It may be asked why so much importance is urged for this subject. It is because of the lamentable condition, mental and physical, of the victim of total collapse of the *alæ nasi*, also because a full appreciation of the part the inferior turbinate plays would probably cause a modification of the methods employed for the reduction of its enlargement.

METHODS IN VOGUE.

Thus there are presented for consideration the methods now in practice for the reduction of the hypertrophy or hyperplasia of the inferior turbinate and the question if there be any other way to attain this end.

Cauterization of the enlarged inferior turbinate with chemical caustics is the oldest and perhaps the most generally used. When the electrocautery was first introduced it was adopted with universal enthusiasm; when the street current was adapted to office use it received fresh impetus, and specialist and general practitioner alike attacked everything within the nasal cavity that appeared the least swollen. Nostrils were cauterized until only the cicatricial tissue and the bones were left, the beautiful, moist, velvety red mucous membrane was converted into a white, dry and functionless tissue and untold misery followed this indiscriminate burning.

Now the reaction has fully set in, the indications and contraindications are better understood and more intelligence is used in the employment of this potent agent, while the diffusion of its limitations has caused the general practitioner to fear to employ it with his wonted liberality.

In reality the field of usefulness of the caustics is very limited, as is the frequency and extent of their application. Their full effect can be measured only after the lapse of an indefinite interval, and then this effect, whether injurious or beneficent, is permanent and progressive; should it be hurtful then it is beyond remedy or our power to allay. Better in this connection than to quote the results of the histologic examination made by Dr. J. L. Goodale¹ of Boston can not be done. Dr. Goodale made examinations in a series of cases in which the patients had been previously cauterized for hypertrophy of the inferior turbinate and who had returned later with recurrence of nasal obstruction. Briefly abstracted, his findings are as follows: Caustic applications cause loss of columnar ciliated epithelium with replacement by cells of the squamous type; they may cause obliteration of canaliculi in basement membrane with formation of connective whose depth depends on the intensity of the cauterization. Contraction of this connective tissue constricts the lumen of the ducts of the glands, leading later on to cystic dilatation, thus explaining the recurrence of the obstruction. It follows that repeated applications become progressively less effective.

1. I am indebted to Dr. Samuel T. Darling, pathologist, Ancon Hospital, for valuable pathologic data.

* Presented as candidate's thesis, American Laryngological, Rhinological and Otological Society.

1. Boston Med. and Surg. Jour., 1904, Dec. 29.

We know, too, that the same injurious effects result from the electrocautery. Its action is more profound than that of the strongest chemical caustic. Its action can not by any known means be in any way limited or controlled; hence one may get an effect deep and destructive when only a superficial effect was desired and *vice versa*, or it may progress, defying every effort to control it until actual atrophy results. When a submucous cauterization is done, its action is not only highly intensified, but the ultimate result will be all the more uncertain. It is easy to draw a picture by secondary deduction from this pathologic sequel to cauterization. Thus the destruction of the ciliated epithelium loses to the tissues their ciliary function; the formation and contraction of connective tissue, closing ducts and blood vessels, prevents proper radiation of moisture and heat to the inspired air, at the same time the cystic degeneration of the glands thus cut off from duty later on cause recurrence of nasal obstruction. Loss of function and blood supply entails loss of materials for the regeneration of the injured tissues, and this failure of recovery of the structural bases of the tissue, added to progressive contraction of the new formed connective tissue, gives at the end advancing atrophy.

Notwithstanding all that has been said against it, cauterization has its field of usefulness. When, for instance, there is an excessive, long-continued discharge and the swollen tissue shrinks completely under the influence of cocain and adrenalin; or there exists a rapidly alternating nasal occlusion, especially at night when in bed; when the nasal membranes seem only slightly swollen, when the pathologic condition appears insufficient to give rise to symptoms so distressing, yet the relaxation of the tissues when in the recumbent position is complete and the obstruction troublesome. It is then that cauterization with one of the chemical caustics is indicated. These cases respond quickly and satisfactorily to a moderate caustic treatment when applied by one skilled in its technic. If the reduction is insufficient after one or at most two cauterizations then another method should be considered.

Concerning the electrocautery it would be, indeed, a consummation to be desired if we could all agree with Grayson, who after a severe but well-merited stricture on the use of the electrocautery thus concludes:

They are luxuries, not necessities, and the longer one pursues his work without them the more likely and able will he be to dispense with them altogether.

That this sentence is not too severe will be conceded by almost anyone who has observed his cases for several—eight or ten—years, who having seen following even after the most careful application progressive contraction and ultimately atrophy must conclude that this agent is too uncertain, too uncontrollable and too severe for the delicate nasal mucous membrane.

That the removal of a portion of the inferior turbinate is at times necessary can not be denied, but that its total ablation is ever justified can not be admitted. Time was when this complete ablation was frequently done, perhaps because it was so easily done, with such simple instruments and because it gave for a time the desired result, viz., a widely open nostril.

Turbinectomy removes a large area of physiologically active tissue and destroys the arch of the inferior turbinate which gives direction to the inspired air current. The mucus secreted is insufficient in quantity to moisten properly the inspired air, the blood supply is insufficient in amount to give the warmth that is so essential to pre-

serve the integrity of the mucous lining of the respiratory tract. Filtration of the air current is impossible. Subsequent contraction aggravates this condition. To a genuine atrophic rhinitis is only one step. Later on in many cases collapse of the *alæ nasi* occurs, adding to the already existing distress the greater evil of absolute nasal occlusion, especially at a time when nasal respiration is most necessary, viz., in sleep and *per contra* when exercising. This latter condition is so distressing and has been often observed, yet has received no mention by any author to whom I have had access save in the last edition, the fifth, of Lennox Browne. On page 789, in concluding the treatment of hypertrophic rhinitis, he says:

In some cases of hypertrophic rhinitis as well as in many cases of polypi collapse of the nostrils remains as a more or less permanent cause of trouble after the original malady has been removed. If unremedied all of the former symptoms are liable to recur.

This, so far as it goes, is very good, but one could wish that he had given the physical explanation for so undesirable an occurrence. In my experience collapse has not followed removal of polypi, nor has it ever been seen so long as the inferior turbinate has not been removed. Therefore, it must be supposed that the presence of the inferior turbinate in some way insures the stability of the intranasal air pressure at a sufficient pressure to maintain a patent vestibule. Some time after the complete removal of the inferior turbinate, in one case it developed as early as three months, the *alæ* begin to collapse. It is noticeable when breathing quickly, as when exercising or in taking deep inhalations, when the flaccid wings collapse, falling in on the septum, completely closing the vestibule like valves, purposely so placed.

The probable explanation of this is that the air within the nostril is evacuated before that from without can gain admittance, resulting in a loss of equilibrium, allowing the greater external pressure to force the flaccid *alæ nasi* against the septum. There occurs here what takes place when the air in the middle ear is exhausted and when it can not be quickly renewed, viz., collapse of the ear drum against the promontory. Collapse of the wings is seldom seen in cases of atrophy, for here the process is so gradual that ample time is given for gaining compensatory muscle action.

This condition of collapse is far worse than the obstruction caused by hypertrophy of the inferior turbinate. In the latter condition there are times when some air can be gotten through the nasal cavities, viz., when the air is dry or when exercising. These momentary aëra-tions serve to ventilate the accessory sinuses, the Eustachian tubes and to keep the mucous glands somewhat active. There are moments of relief. With collapse, however, the occlusion is complete and permanent, with the entire train of symptoms following in its wake; insufficient aëration of the accessory sinuses with the well-known dangers entailed thereby. The middle-ear catarrh with its tinnitus and its deafness, for which turbinectomy is often done, is undoubtedly aggravated by the absence of any ventilation. In fact, cases have been seen in which the progress to a practical total deafness was noticeably hastened. Also the same mental symptoms of aprosopia have been observed in this condition as in that attendant on occlusion from intranasal hypertrophy. Mouth breathing, with its almost interminable train of distress and associated with the collapsed *alæ*, so alters the facial expression as to make it appear unnaturally narrow, drawn and pinched, while the voice is usually much changed in tone.

AUTHOR'S METHOD.

Working in view of this importance of preserving these several functions of the inferior turbinate intact, I have for the past six years done an operation simple in itself, but most efficacious in result and permanent in character, with no hurtful sequelæ to mark its performance or mar its record. Only very recently has anything similar been proposed, so far as my reading has informed me. The operation consists in one or more incisions through the mucous membrane of the hypertrophic turbinate well down to the bone, when with a broad nasal saw the bone is cut into to a depth depending on the nature of the bone, whether cancellous or vitreous, which is easily detected by the sensation imparted to the hand. If the bone be hypertrophied and dense the cut is carried well down into its substance. The nostril is next cleansed, the edges of the incised mucous membrane are carefully packed into the osseous cut which, as above indicated has been purposely made with a broad saw to admit of the introduction of the overlapping edges of the soft parts. This adjustment of the tissues is maintained by a carefully placed pledget of cotton saturated in a solution of equal parts of compound tincture of benzoin and flexible collodion. This dressing may remain *in situ* for two or three days when after careful soaking it is as carefully removed. The edges of the incision should not be disturbed when the cotton is removed, else the object of the operation will be defeated. Rarely will repacking be necessary. The direction of the incision will depend on the nature of the enlargement; it may be made from above downward, at the most dependent part of the turbinate upward, or, as is most usually necessary, directly into the body from within outward. It will be found that following this operation much absorption will occur, so that in the course of a short time the nostril will be sufficient for the full performance of its physiologic function.

I have tried the deep incision alone as has been somewhat recently advised, also the removal of a V-shaped section of the mucous membrane side by side with the method I had for so long employed, but it seemed to me that better result was obtained when both the mucous membrane and the bone were included in the incision. The furrow in the bone supplies a base for the attachment of the incised membrane, the firmness of the adhesion preventing the sudden distension so common and troublesome in these hypertrophic conditions.

In conclusion, the advantages of a procedure of this kind over cauterization with either chemicals or electrocautery, as well as the partial or complete turbinectomy, are:

1. Preservation of physiologically active tissues.
2. Freedom from disagreeable reaction or complications.
3. Absence of shock, since but slight local anesthesia is necessary.
4. Freedom from aggravation of existent disease in related cavities.
5. Ease and speed in performance, the instruments used being few and simple.

Medical Organization.—Complete organization of the medical profession, wisely guided and administered, will mean for the people better educated and trained physicians; better and more wisely administered public health and sanitary measures; more careful attention to the protection and the saving of human life.—Philip Mills Jones, M.D., in the *Bull. of Am. Acad. of Med.*

CELLULITIS AND MYOSITIS OF THE ABDOMINAL WALL, SIMULATING INTRA-ABDOMINAL CONDITIONS.

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The cases which follow illustrate very well how closely conditions of the muscular layers of the abdominal wall, accompanied by symptoms most commonly referable to processes inside the abdomen, may be mistaken for the last named conditions.

CASE REPORTS.

CASE 1.—S. S., aged 18, was admitted to the New York Hospital, Dr. Bolton's service, July 21, 1903, complaining of pain on the right side of the abdomen.

History.—Family history negative; past history negative; appetite good; bowels always regular.

Present Illness.—One evening, eight days before admission, the patient ate a large quantity of peanuts, cakes, candy and other Coney Island delicacies. The next morning he awoke with pain in his abdomen. At first the pain was diffuse, but later became localized on the lower right side of the abdomen. It was cramp-like in character, the cramps coming in paroxysms. The pain then disappeared for about three days, and the patient was up and about with only a dull ache in the right side. On the fourth day it returned with greater severity and remained localized on the lower right side, which gradually grew tender to the touch. At the onset the patient vomited, and he has vomited at intervals since, but at no time has the vomiting been distressing. The bowels were constipated, but have moved freely by medication. He has had fever, but no definite chill.

Physical Examination.—The patient was evidently in considerable pain. The face was flushed, pulse twenty-six to the quarter, good volume, regular in force and rhythm, temperature, 103.6 F. The heart and lungs were normal. The abdomen was slightly distended. The respiratory movements were limited above the navel and absent below it. On palpation the abdomen was everywhere slightly tender. In the right iliac region there was a hard, readily defined mass, extending from the anterior border of the rectus well into the flank and from the level of a line drawn through the navel down to within one inch of Poupart's ligament. This mass was extremely tender, the slightest pressure causing the patient to wince with pain. In this area there was also marked muscular rigidity. Very gentle percussion over the mass elicited a tympanitic sound. Hernial rings and genitalia were normal, and the rectal examination was negative. The leucocytes were 16,000.

The case was diagnosed as acute appendicitis with the formation of an abscess, and the patient was prepared for immediate operation.

Operation.—An incision 10 cm. long was made over the center of the palpable mass down through the external oblique where a small quantity of serosanguineous, slightly purulent serum was found on the internal oblique muscle which was edematous and rather markedly indurated. On cutting through it considerable edema and induration was found in the subperitoneal tissue, and the peritoneum itself seemed swollen and edematous. The peritoneal cavity was then opened and the intestines, cecum and appendix found to be uninfamed. As the appendix was a very long one, it was removed. The peritoneum was then carefully closed. The muscular and fascial layers were loosely approximated, a drain was inserted in each angle of the wound down to the peritoneum, and the skin closed loosely with silk.

Subsequent History.—The wound discharged a reddish grumous material composed of pus cells and shreds of muscle for about 12 days and the skin wound broke open, the sutures cutting through the skin. This discharge then gradually ceased and the wound rapidly granulated, healing in about four weeks from the time of the operation. The pain disappeared on the second day following the operation. The temperature ranged from 101 to 103 until suppuration ceased and then dropped to normal. The patient's recovery was uneventful.